

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

Date: 11/9/79

Project Title: "Develop VAX/ICES Basic System (Phase I) and GTSTRU DL and GTTABLE Subsystem (Phase II) for the DEC/VAX Computer"

Project No: E-20-675

Project Director: Dr. L. Z. Emkin

Sponsor: Digital Equipment Corporation

Agreement Period: From 9/14/79 Until 9/17/81

Type Agreement: Agreement Dated 9/14/79

Amount: \$187,000 Digital Equipment Corp.
165,000 E-20-325 (Cost Sharing)
\$352,000 TOTAL

Reports Required: Quarterly Progress

Sponsor Contact Person (s):

Technical Matters

Contractual Matters
(thru OCA)

Digital Equipment Corp.
200 Forest Street
Marlborough, MA 01752

ATTN: Manager, Application Marketing Development
Engineering Systems Group

Defense Priority Rating:

Assigned to: Civil Engineering (School/Laboratory)

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director-EES
Accounting Office
Procurement Office
Security Coordinator (OCA)
Reports Coordinator (OCA)

Library, Technical Reports Section
EES Information Office
EES Reports & Procedures
Project File (OCA)
Project Code (GTRI)
Other C. E. Smith

SPONSORED PROJECT TERMINATION SHEETDate 3/29/82Project Title: ^{VIX} Develop VZX/ICES Basic System (Phase I) and GTSTRUDL and GITTABLE Subsystem (Phase II) for the DEC/VAX Computer.

Project No: E-20-675

Project Director: Dr. L. Z. Emkin

Sponsor: Digial Equipment Corp.

Effective Termination Date: 9/19/81Clearance of Accounting Charges: 9/19/81

Grant/Contract Closeout Actions Remaining:

- ☒ Final Invoice and Closing Documents
☐ Final Fiscal Report
☒ Final Report of Inventions
☐ Govt. Property Inventory & Related Certificate
☐ Classified Material Certificate
☐ Other _____

Assigned to: Civil Eng (School/Laboratory)COPIES TO:

Administrative Coordinator
Research Property Management
Accounting
Procurement/EES Supply Services

Research Security Services
Reports Coordinator (OCA)
Legal Services (OCA)
Library

EES Public Relations (2)
Computer Input
Project File
Other _____



GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA 30332



GTICES SYSTEMS LABORATORY
SCHOOL OF CIVIL ENGINEERING

August 15, 1980

F 20-675
(404) 894-2215
(404) 894-2260

Mr. James C. Morrison
Marketing Manager
Digital Equipment Corporation
Marlboro, Massachusetts 01752

Dear Mr. Morrison:

This first project status report discusses GTICES/VAX development in terms of the Macro Task Diagram prior to system installation in February 1980 to July 31, 1980.

Task S - Start

I made two trips to the Marlboro facility to meet with Mr. Tom Kent. The purpose of these visits was to gain an understanding of the VAX/11-780 system and its operating system in order to adequately estimate development time for GTICES/VAX. In addition, many valuable insights into implementation techniques were derived from these visits.

Potential student assistant programming staff were identified and interviewed.

Task T - Training

Training began while accessing the time-sharing VAX system in Marlboro. Each member of the programming staff was assigned tasks that would help them gain GTICES understanding as well as familiarity with BLISS 32 and VAX FORTRAN IV-PLUS. Access to the Marlboro VAX continued until shortly before our system was installed in February 1980.

Task P - Planning

Final designs for each component of the GTICES System were drafted. Alternative implementation were examined where they existed. Two potential problem areas were noted at this point, linking 1,000 to 1,200 separate program modules in a single address space and accommodating very large blocks of data storage. The implementation of Disk Management and Dynamic Array services were seen to be relatively straightforward.

The development plan of the GTICES/VAX Language Processors were also set forth during this task period.

Mr. James C. Morrison
Page Two
August 15, 1980

Task 1

The ICETTRAN Precompiler was implemented during the 1st and 2nd quarters of 1980. Sixty percent (60%) of GTSTRU DL and all of GTTABLE have been successfully precompiled to date. Work on refinements and investigation into optimization in the precompiler continues.

Task 2

Special loader coding was implemented during the 1st and 2nd quarters of 1980. This consists primarily of pre-processing of Linker directives. It should be made clear here that significant drawbacks exist in linking the way we are forced to at this time. To date we have been unable to do the following:

- *1. Produce Position Independent (PIC) FORTRAN modules,
2. Install a sharable image,
3. Use DEBUG on an image containing a large number (>500) of modules,
4. Link components of the executable image separately.

*Not to be addressed by VMS Group prior to Version 3, 1H82!

Work-around measures are being explored now so that we may speed up the linking process without sacrificing flexibility.

Some interaction with the VMS systems programmers and designers would prove useful to both us, DEC, and other users in these regards I feel sure.

Task 3

Basic System coding began while we had access to the Marlboro VAX system. Design and coding were carried out in the following areas:

- Dynamic Array Management
- Disk Subsystem Facility
- Data Pool Management
- Program Control Facility

All Basic System components listed above are working well.

Mr. James C. Morrison
Page Three
August 15, 1980

Task 4

GTCDL design and coding are taking place now. Completion is expected during 4Q80.

Task 5

Miscellaneous utilities have been coded in part. Utilities that will not be needed until the future will be coded then.

Task 6

GTTABLE precompilation and checkout has been completed.

Task 7

GTSTRUDL precompilation and checkout is approximately 60% complete.

Task 8

GTTABLE and GTSTRUDL command processing is complete in that all commands are operative via the GTICES command interpreter. The CDL subsystem allows source changes to be applied to the command definitions. CDL will be completed during 4Q80.

Task 9

GTTABLE and GTSTRUDL testing has begun in the areas of frame analysis, finite element analysis, and graphics.

The following personnel are working on the project.

<u>Full-Time Staff (Part-Time Work)</u>	<u>Student Assistants</u>
David B. Green - Stacy V. Stringer	P. Allen Jensen
John West - Michael W. Thurmond	Thomas Koehler
Leroy Z. Emkin - Janet C. Duke	James McCartney
Kenneth M. Will - Joan M. Incrocci	David W. Keck
Larry F. Kahn	Simon Bailey

Mr. James C. Morrison
Page Four
August 15, 1980

In summary, the progress of GTICES/VAX development is ahead of schedule. Work will begin soon to bring all GTSTRU DL capabilities up on the GTICES/VAX.

Sincerely,

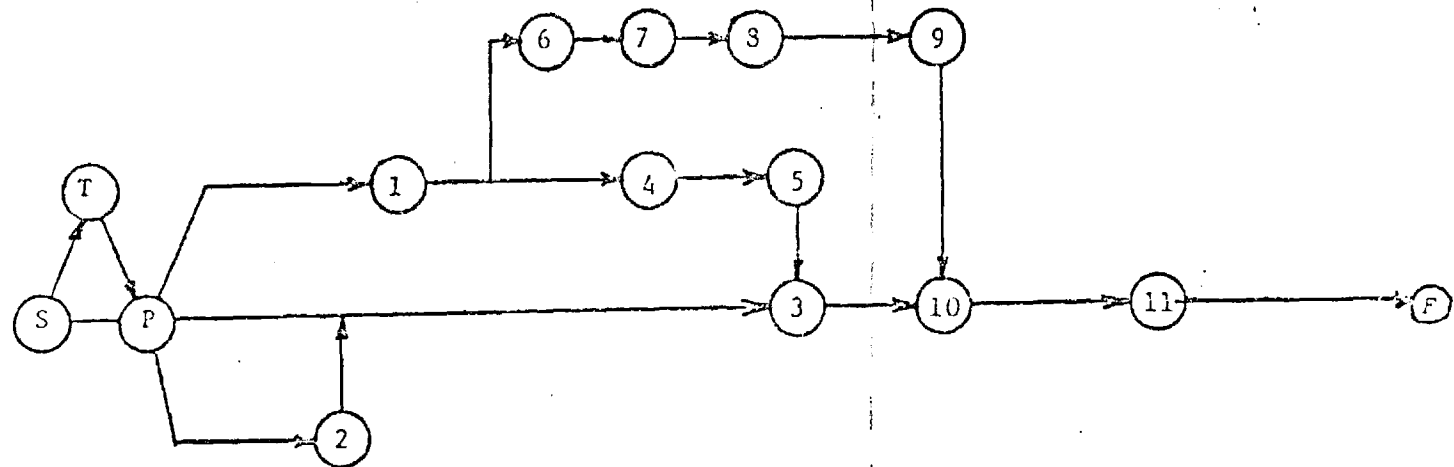
David B. Green, III

DBG/ji
xc: L. Z. Emkin, Director, GTISL

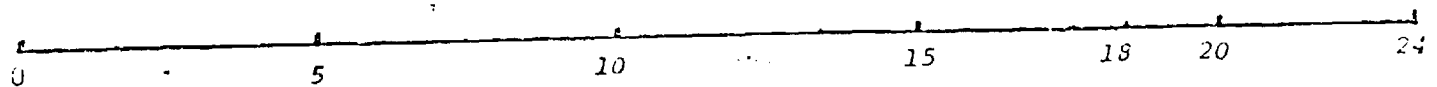
Enclosure: GTICES/VAX Macro Task Diagram

- S - Start
- T - Project personnel training on the DEC/VAX (1-month)
- P - Detailed planning and design (2-months)
- 1 - ICETRAM Precompiler coding (5-months)
- 2 - Special Loader coding (4-months)
- 3 - VAX/ICES Basic System coding (13-months)
- 4 - GTCDL Subsystem coding (5-months)

- 5 - Miscellaneous System Utilities (3-months)
- 6 - GTTABLE Subsystem precompilation and error correction (1-month)
- 7 - GTSTRUDL Subsystem precompilation and error correction (2-months)
- 8 - GTTABLE and GTSTRUDL CDL command processing check out (2-months)
- 9 - GTTABLE and GTSTRUDL processing check out and debugging (2-months)
- 10 - Complete system generated and initial release to selected DEC customers.
- 11 - General system debugging and fine tuning (4-months)
- F - Final check out and finish (2-months)



Note: Circled activities represent activities ending dates.



Macro Task Diagram for GTICES/VAX development for DEC/VAX Computers

GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA 30332GTICES SYSTEMS LABORATORY
SCHOOL OF CIVIL ENGINEERING

March 3, 1981

(404) 894-2215
(404) 894-2260

Mr. James C. Morrison (MR1-1/M42)
Marketing Manager, Structural Applications
Engineering Systems Group
Digital Equipment Corporation
200 Forest Street
Marlboro, Massachusetts 01752

Dear Mr. Morrison:

This second project status report discusses GTICES/VAX development in terms of the Macro Task Diagram during the period of August 1, 1980 to December 31, 1980.

Task S - Start

Completed

Task T - Training

Completed

Task P - Planning

Completed

Task 1

Completed

Task 2

After working with individuals in the VMS group, most of the difficulties cited in the previous status report have been worked out. The following deficiencies still remain however.

- 1) cannot use the DEBUG facility on a large number of modules
- 2) cannot LINK separately groups of modules into sharables for execution

Mr. James C. Morrison
Page Two
January 22, 1981

These deficiencies reflect DIGITAL's lack of support for users who engage in large-scale application program development. From my vantage point, only a very few number of persons in DIGITAL are sufficiently aware of the constraints currently placed on software developers like ourselves. We feel that more support should be focused on tools that assist development and maintenance of very large-scale applications. At the present time, the scale is tipped in favor of tools to aid system developers. We are pledged to continue to assist and make recommendations wherever they may be of benefit to state-of-the-art application software development.

Task 3

Completed

Task 4

GTCDL design is complete. Coding is 90% complete. GTCDL will be operational in February, 1981.

Task 5

Completed

Task 6

Completed

Task 7

Completed

Task 8

GTTABLE and GTSTRU DL command processing is nearly complete. As soon as GTCDL is completed, the command dictionaries will be generated from source.

Mr. James C. Morrison
Page Three
January 22, 1981

Task 9

Many areas have been undergoing testing including frame analysis, dynamic analysis, finite element analysis, and graphics. Now, initial release of the system is expected to take place at the end of February 1981, following three or four weeks of extensive quality assurance testing on the control version.

The following technical personnel are working on the project.

<u>Full-Time Staff</u> (part-time effort)	<u>Student Assistants</u>
David Green	P. Allen Jensen
Leroy Emkin	Thomas Koehler
Kenneth Will	James McCartney
Larry Kahn	David Keck
John West	Simon Bailey
Stacy Stringer	
Michael Thurmond	
L. C. Wong	

In regard to project completion estimates and funds expended, the following are my estimates as of 30 January 1981:

Approximate percent project completed = 70%

Approximate percent funds expended = 60%

Since the official beginning of the development phase of the project was 24 March 1980 (as per my letter to Bill O'Brien dated 21 April 1980), and since we are approximately 70% complete on the twenty-four (24) development work, I estimate that we are approximately three (3) months ahead of schedule!

Sincerely yours,

/

David B. Green, III
Manager, GTISL Systems Development

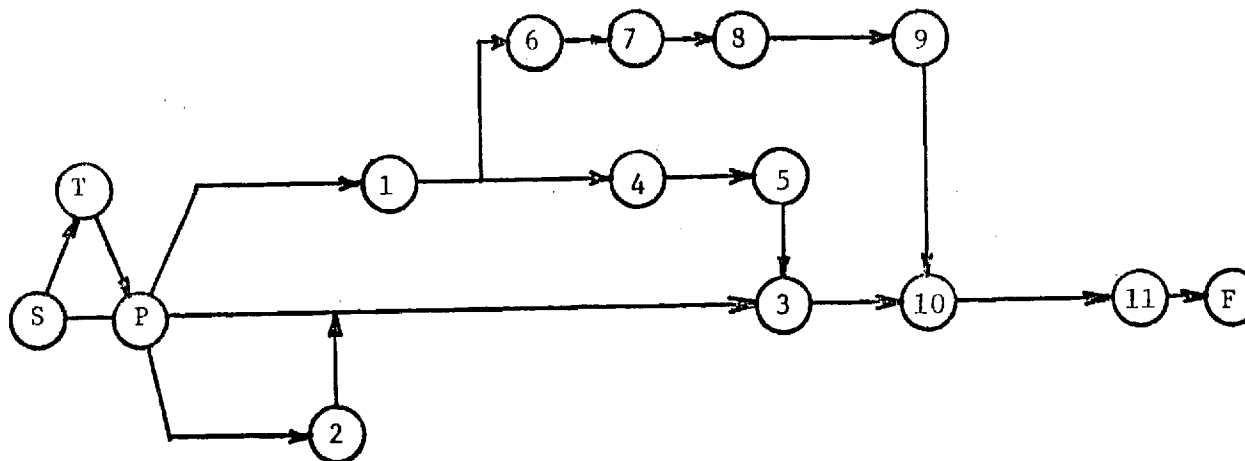
DBG/jmi

xc: L. Z. Emkin, Director, GTISL
D. Vaughn, DEC, Atlanta

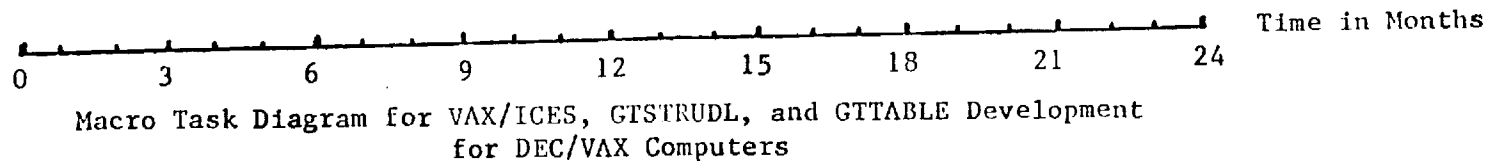
Enclosure: GTICES/VAX Macro Task Diagram

- S - Start
- T - Project personnel training on the DEC/VAX (1-month)
- P - Detailed planning and design (2-months)
- 1 - ICETRAN Precompiler coding (5-months)
- 2 - Special Loader coding (4-months)
- 3 - VAX/ICES Basic System coding (13-months)
- 4 - GTCDL Subsystem coding (5-months)

- 5 - Miscellaneous System Utilities (3-months)
- 6 - GTTABLE Subsystem precompilation and error correction (1-month)
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- F - Final check out and finish (2-months)



Note: Circled activities represent activity ending dates.





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ATLANTA, GEORGIA 30332



GTICES SYSTEMS LABORATORY
SCHOOL OF CIVIL ENGINEERING

August 20, 1981

(404) 894-2215
(404) 894-2260

Mr. James C. Morrison (MR1-1/M42)
Marketing Manager, Structural Applications
Engineering System Group
Digital Equipment Company
200 Forest Street
Marlboro, MA 01752

Dear Mr. Morrison:

This, the third project status report discussing GTICES/VAX development, covers the period from January 1, 1981 to June 30, 1981. The headings are the same as those which appear in the attached Macro Task Diagram.

Task S - Start

Completed

Task T - Training

Completed

Task P - Planning

Completed

Task 1

Completed

Task 2

The current LINKER facility of VMS 2.3 is barely adequate. Features promised in version 3.0 are considered to be critical to improving development and production performance. GTSTRUDL cannot perform well on small to medium system configurations unless a large portion of the image can be shared. The image sections cannot be shared until the features of Version 3 are available.

Task 3

Completed

Task 4

Completed

Task 5

Completed

Task 6

Completed

Task 7

Completed

Task 8

Completed

Task 9

Completed

Task 10

Digital offices in Marlboro, Reading, England, Frankfurt, W. Germany, and Paris, France received the first release of GTSTRU DL in late April. To date all these systems have been installed and are working as promised. In Marlboro, GTSTRU DL was loaded and successfully tested on a VAX-750.

Task 11

Tuning recommendations are being compiled. These recommendations will be provided with each release tape to assist customers in loading and execution of GTSTRU DL.

Debugging activity continues. At present we are planning for a second release which will reflect error detected during field testing.

The following is a list of technical personnel who are working on the project.

Full-time Staff (part-time effort)

David B. Green
Leroy Z. Emkin
Kenneth M. Will
Lawrence F. Kahn
John P. West
Stacy V. Stringer
Michael W. Thurmond
L. D. Wong

Student Assistants

P. Allen Jensen
James McCartney
David Keck
Simon Bailey

Mr. James C. Morrison
August 20, 1981
Page 2

In regard to project completion estimates and funds expended, the following are my estimates as of June 30, 1981:

Projects Completed 95%

Funds Expended 90%

As the above figures indicate, the effort is technically very near complete. Since the official start date is March 24, 1980 (as per my letter to Bill O'Brien, dated April 21, 1980) I estimate that we are 6 months ahead of schedule.

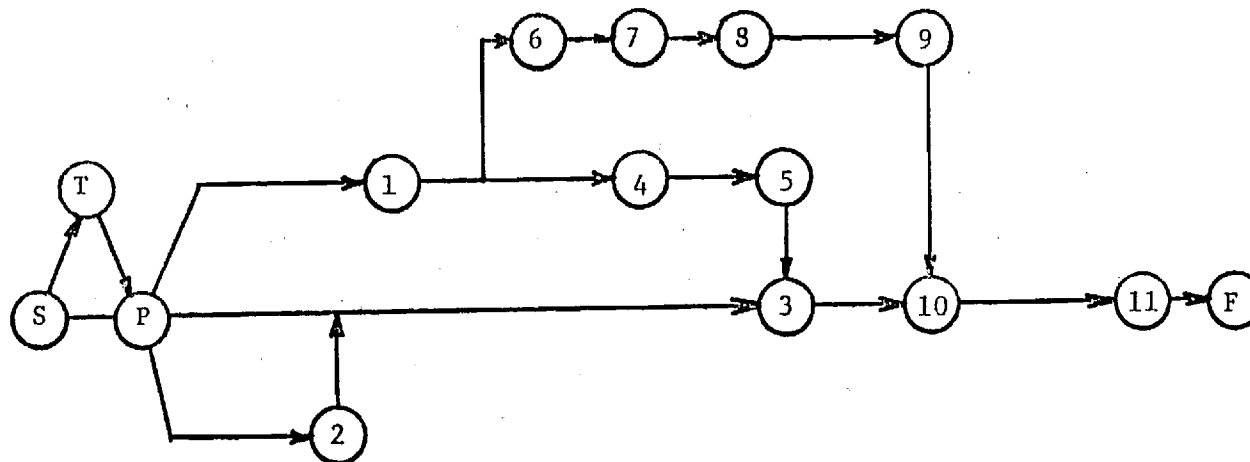
Sincerely yours,

David B. Green III
Manager, GTISL Systems Development

DBG/ji
Enclosure: GTICES/VAX Macro Task Diagram
xc: L. Z. Emkin, Director, GTISL
D. Vaughnm DEC, Atlanta

- S - Start
- T - Project personnel training on the DEC/VAX (1-month)
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